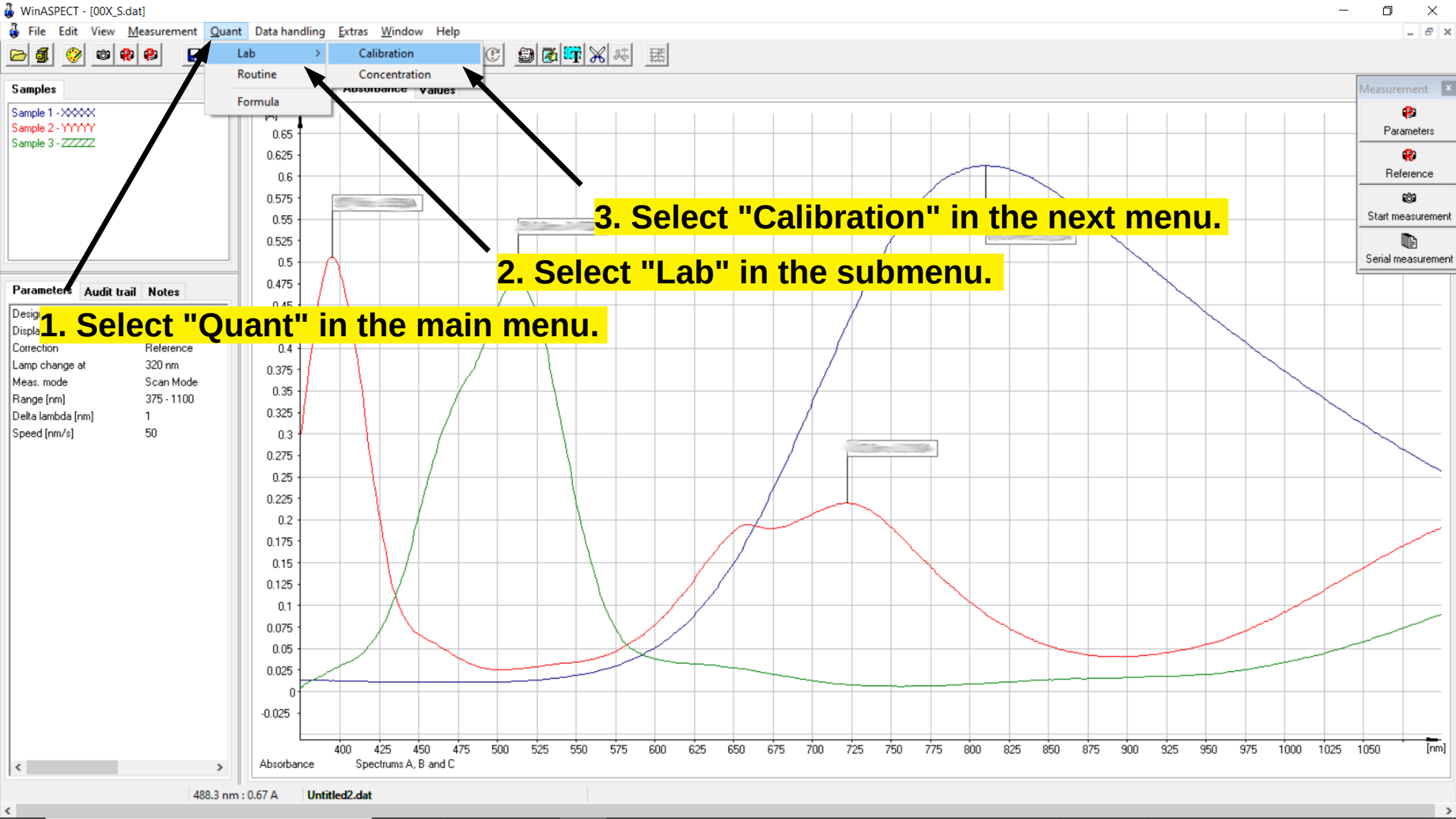




# Spectrophotometry

**Determination of sample concentration.**



WinASPECT - [Calibration]

File

Measurement

Quant

Data handling

Extras

Window

Help

00X\_S.dat

Samples

Sample 1 - XXXXX

Sample 2 - YYYYY

Sample 3 - ZZZZZ

Parameters

Audit trail

Notes

Designation

SPECORD 40

Display

Absorbance

Correction

Reference

Lamp change at

320 nm

Meas. mode

Scan Mode

Range [nm]

375 - 1100

Delta lambda [nm]

1

Speed [nm/s]

50

Transmittance

Absorbance

Values

[A]

0.6

0.55

0.5

0.45

0.4

0.35

0.3

0.25

0.2

0.15

0.1

0.05

0

400

500

Absorbance

Spectrums

1. Click on the "Edit" icon.

2. Select "Measeurement parameters" from the icon menu.

Calibration

File

Edit

To Conc.

Close

General

Measurement parameters

Audit trail

Operator:

Regression Model

y = B%

Calibration Model

Measured value M(x1)

Wavelength 1

Wavelength 2

Wavelength 4

Calibration Unit

mol/L

Ordinate

Absorbance

Cell Pathlength:

1

[cm]

No. of Standards:

1

Measure standards

☒

Parameter File:

00X\_C.par

Browse

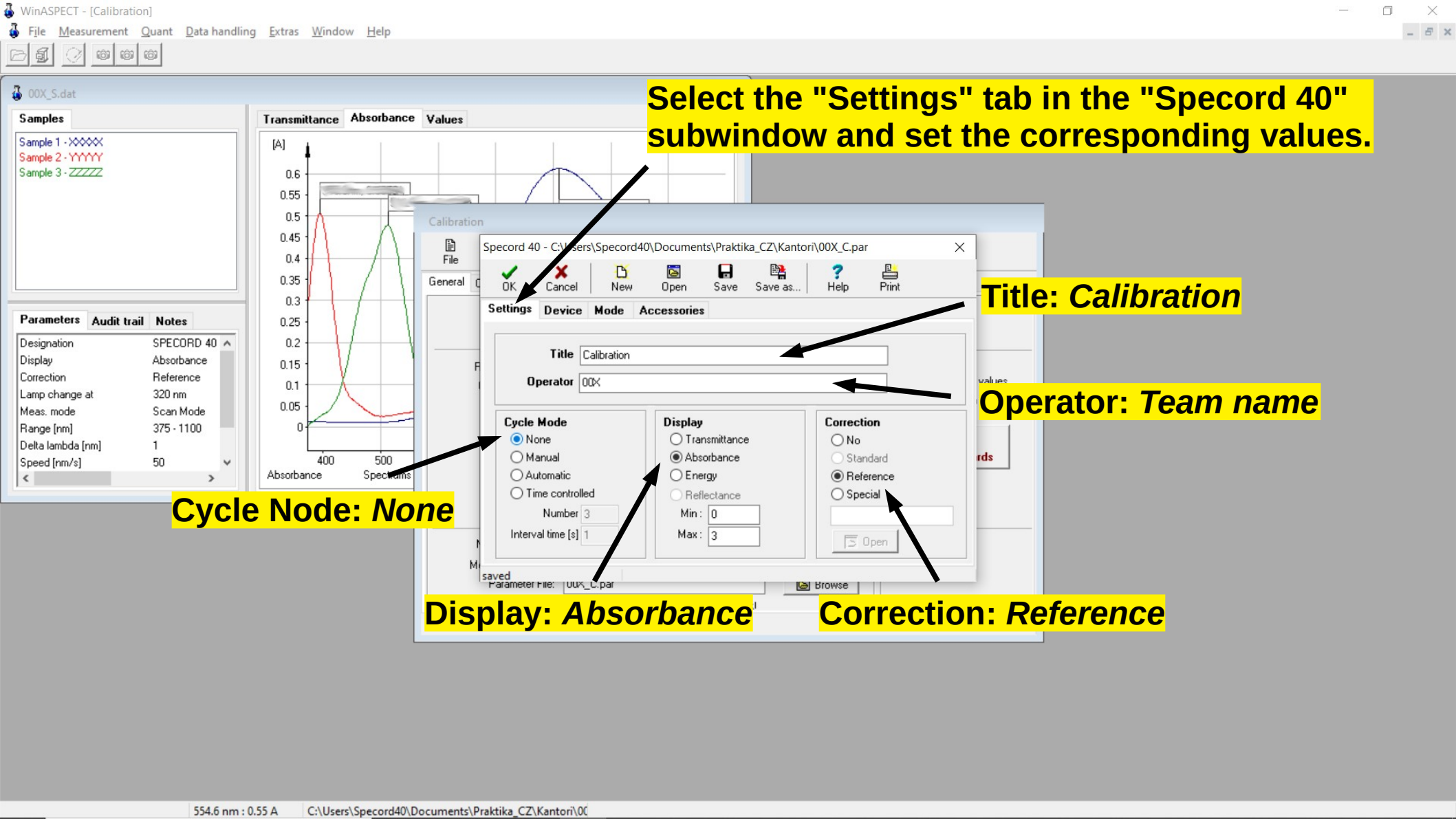
C:\Users\Specord40\Documents\Prakt

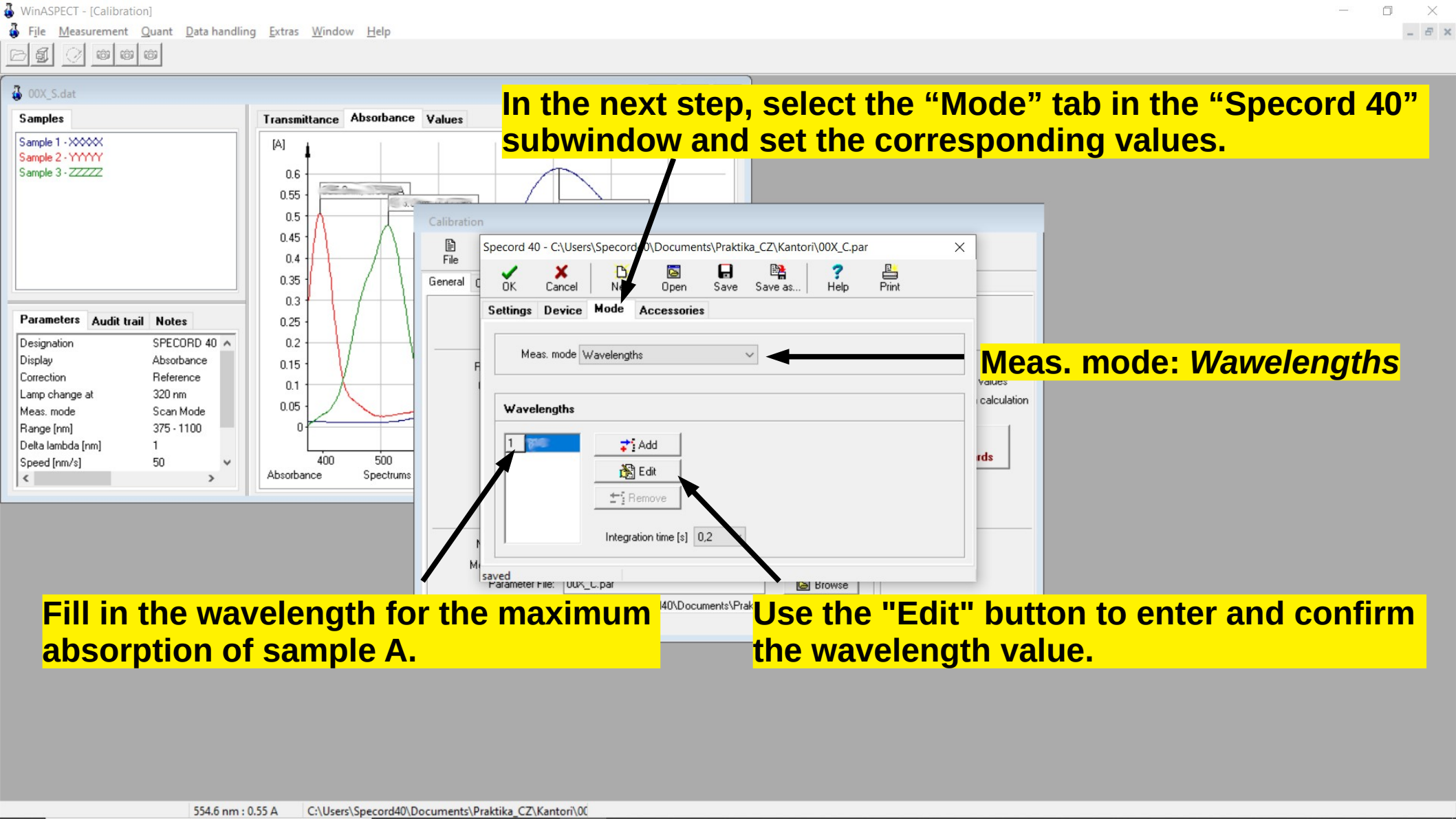
Acquire standard values and proceed with calculation

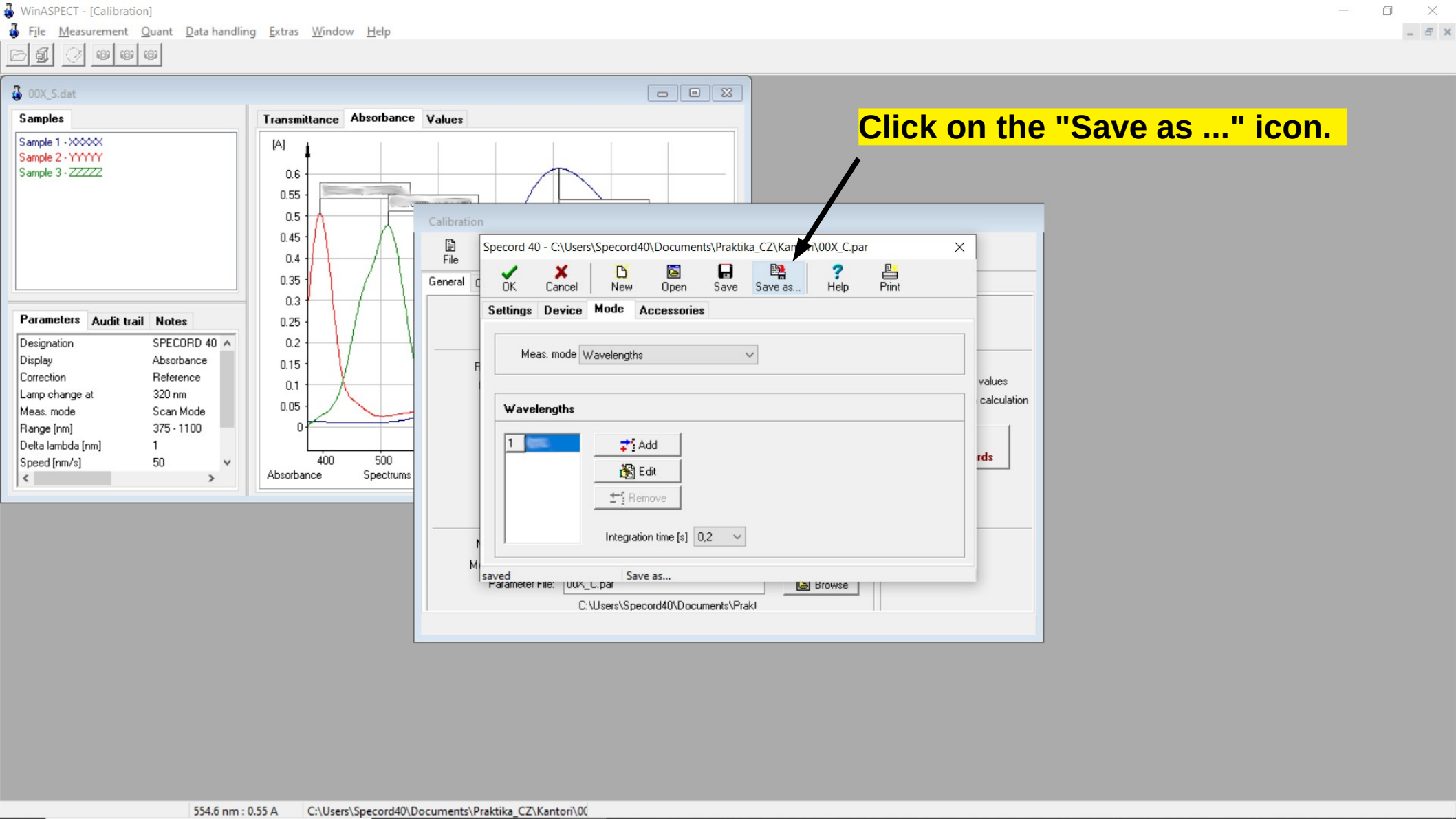
Standards

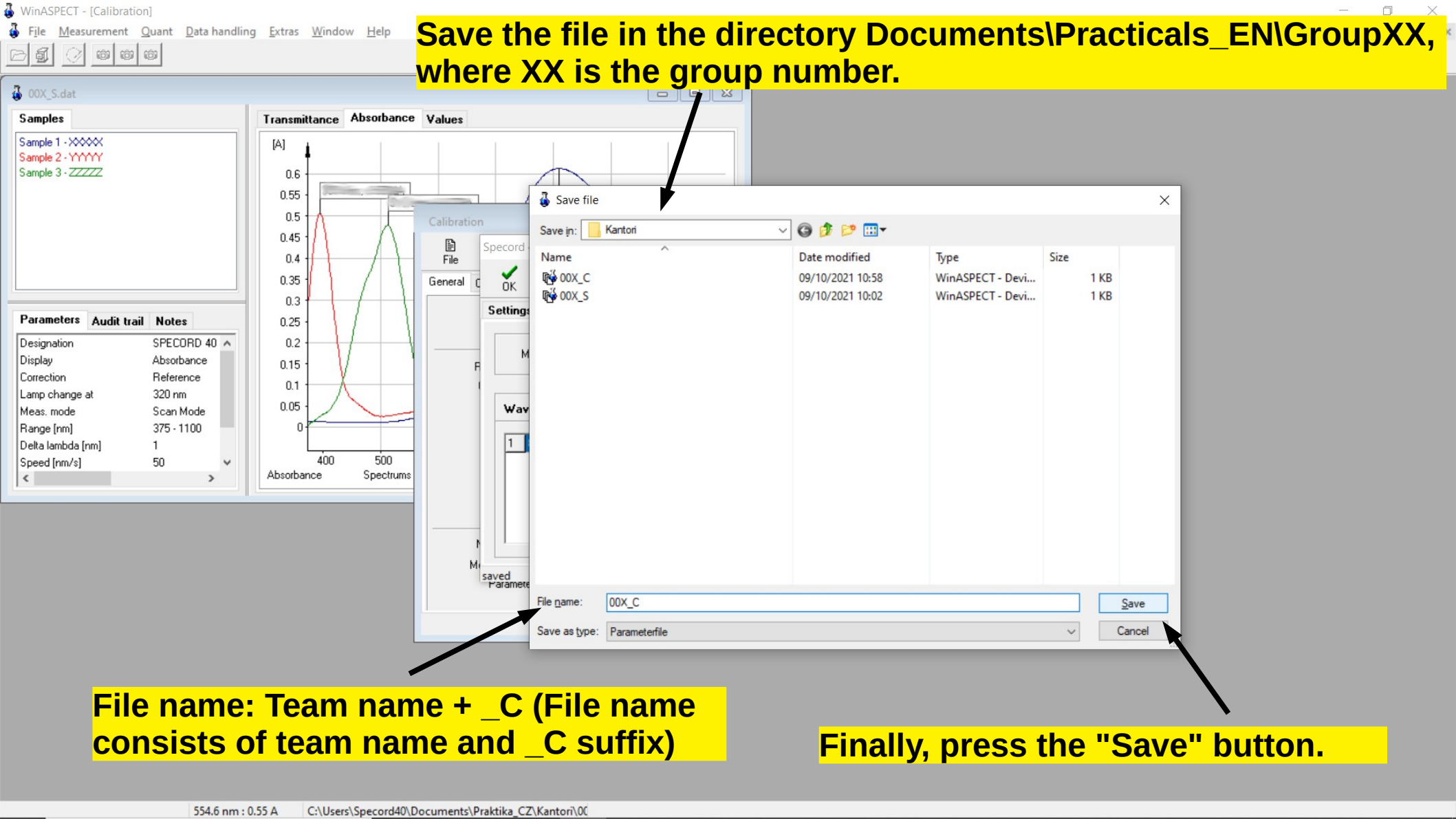
554.6 nm : 0.55 A

C:\Users\Specord40\Documents\Praktika\_CZ\Kanton\00











WinASPECT - [Calibration]

FileMeasurementQuantData handlingExtrasWindowHelp

00X\_S.dat

Samples

Sample 1 - XXXXX  
Sample 2 - YYYYY  
Sample 3 - ZZZZZ

ParametersAudit trailNotes

DesignationSPECORD 40  
DisplayAbsorbance  
CorrectionReference  
Lamp change at320 nm  
Meas. modeScan Mode  
Range [nm]375 - 1100  
Delta lambda [nm]1  
Speed [nm/s]50

TransmittanceAbsorbanceValues

[A]

Calibration

Specord 40C:\Users\Specord40\Documents\Praktika\_CZ\Kantori\00X\_C.par

OKCancelNewOpenSaveSave as...HelpPrint

SettingsDeviceModeAccessories

Meas. modeWavelengths

Wavelengths

1

AddEditRemove

Integration time [s]0.2

Parameter file:00X\_C.par

Browse

554.6 nm : 0.55 A C:\Users\Specord40\Documents\Praktika\_CZ\Kantori\00

WinASPECT - [Calibration]

File

Measurement

Quant

Data handling

Extras

Window

Help

00X\_S.dat

Samples

Sample 1 - XXXXX

Sample 2 - YYYYY

Sample 3 - ZZZZZ

Parameters

Audit trail

Notes

Designation

Display

Correction

Lamp change at

Meas. mode

Range [nm]

Delta lambda [nm]

Speed [nm/s]

SPECORD 40

Absorbance

Reference

320 nm

Scan Mode

375 - 1100

1

50

Transmittance

Absorbance

Values

[A]

0.6

0.55

0.5

0.45

0.4

0.35

0.3

0.25

0.2

0.15

0.1

0.05

0

400

500

Absorbance

Spectrums

Calibration

File

Edit

To Conc.

Close

General

Calculation

Designation:

Operator:

Regression Model

Calibration Model

Wavelength 1

Wavelength 2

Wavelength 4

Calibration Unit:

Ordinate:

Cell Pathlength:

No. of Standards:

Measure standards

Parameter File:

Calibration

00X

$y = A + B \cdot x$

Measured value M(x1)

x1

Interactive

mol/L

Absorbance

1

5

☒

00X\_C.par

Browse

C:\Users\Specord40\Documents\Praktika\_CZ\Kanton\00

Select in the drop-down menu

Regression Model:  $y = A + B \cdot x$

Acquire standard values and proceed with calculation

Standards

Designation: Concentration

Operator: Team name

Calibration Unit: mol/L

No. of Standards: 5

Cell Pathlength: 1 cm

541.4 nm : 0.35 A

C:\Users\Specord40\Documents\Praktika\_CZ\Kanton\00

WinASPECT - [Calibration]

File

Measurement

Quant

Data handling

Extras

Window

Help

00X\_S.dat

Samples

Sample 1 - XXXXX  
Sample 2 - YYYYY  
Sample 3 - ZZZZZ

Parameters

Audit trail

Notes

Designation

Display

Correction

Lamp change at

Meas. mode

Range [nm]

Delta lambda [nm]

Speed [nm/s]

SPECORD 40

Absorbance

Reference

320 nm

Scan Mode

375 - 1100

1

50

Transmittance

Absorbance

Values

[A]

0.6

0.55

0.5

0.45

0.4

0.35

0.3

0.25

0.2

0.15

0.1

0.05

0

400

500

Absorbance

Spectrums

Calibration

File

Edit

To Conc.

Close

General

Calculation

Designation:

Operator:

Calibration

00X

Regression Model

Calibration Model

Wavelength 1

Wavelength 2

Wavelength 4

Calibration Unit:

Ordinate:

Cell Pathlength:

$y = A + B \cdot x$

Measured value  $M(x)$

x1

mol/L

Absorbance

1 [cm]

No. of Standards:

Measure standards

Parameter File:

5

☒

00X\_C.par

Browse

C:\Users\Specord40\Documents\Praktika

Acquire standard values  
and proceed with calculation

Standards

Click on the "Standards" button.

541.4 nm : 0.35 A

C:\Users\Specord40\Documents\Praktika\_CZ\Kanton\00

WinASPECT

File Measurement Quant Data handling Extras Window Help

00X\_S.dat

Samples

Sample 1 - XXXXX  
Sample 2 - YYYYY  
Sample 3 - ZZZZZ

Parameters Audit trail Notes

Designation SPECORD 40  
Display Absorbance  
Correction Reference  
Lamp change at 320 nm  
Meas. mode Scan Mode  
Range [nm] 375 - 1100  
Delta lambda [nm] 1  
Speed [nm/s] 50

Transmittance Absorbance Values

[A]

0.6  
0.55  
0.5  
0.45  
0.4  
0.35  
0.3  
0.25  
0.2  
0.15  
0.1  
0.05  
0

400 500

Absorbance Spectrums

Calibration

File Edit To Conc. Close

General Calculation

Standards

OK Cancel Start! Reference Statistics

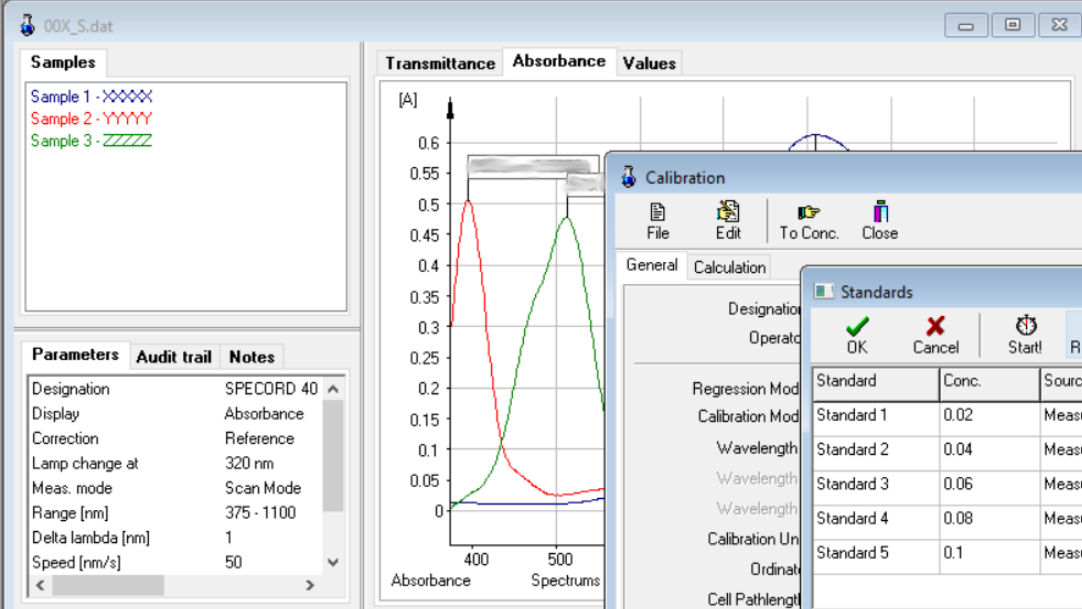
Standard	Conc.	Source	A
Standard 1	0.02	Measure: 00X_C.par	0.0000
Standard 2	0.04	Measure: 00X_C.par	0.0000
Standard 3	0.06	Measure: 00X_C.par	0.0000
Standard 4	0.08	Measure: 00X_C.par	0.0000
Standard 5	0.1	Measure: 00X_C.par	0.0000

Selected standard: Standard 1 (De)activate

Measure: 00X\_C.par Source

Standards

**Copy the concentrations of the standards A1, A2, A3, A4 and A5.**



**Calibration**

File Edit To Conc. Close

General Calculation

Designation: Operator: OK Cancel Start! Reference Statistics

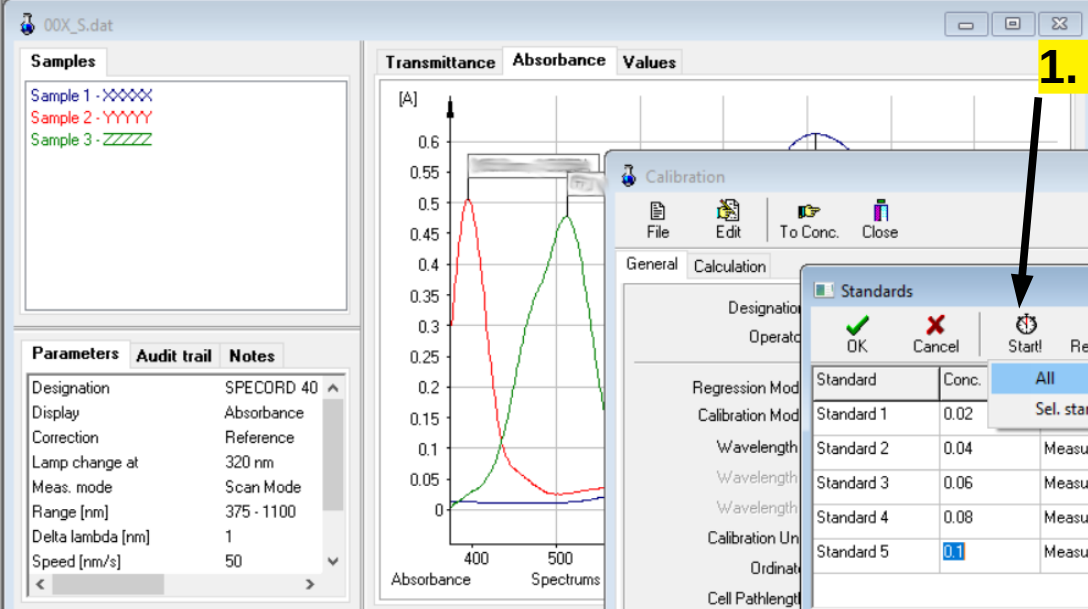
Standard	Conc.	Source	A
Standard 1	0.02	Measure: 00X_C.par	0.0000
Standard 2	0.04	Measure: 00X_C.par	0.0000
Standard 3	0.06	Measure: 00X_C.par	0.0000
Standard 4	0.08	Measure: 00X_C.par	0.0000
Standard 5	0.1	Measure: 00X_C.par	0.0000

Selected standard: Standard 1 (De)activate

Measure standard: Measure: 00X\_C.par Source

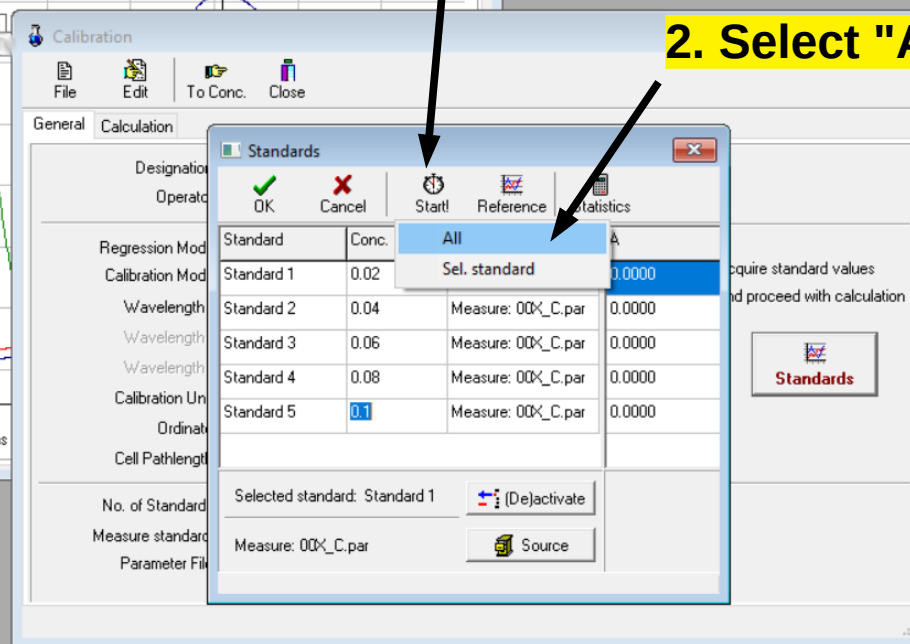
Parameter File

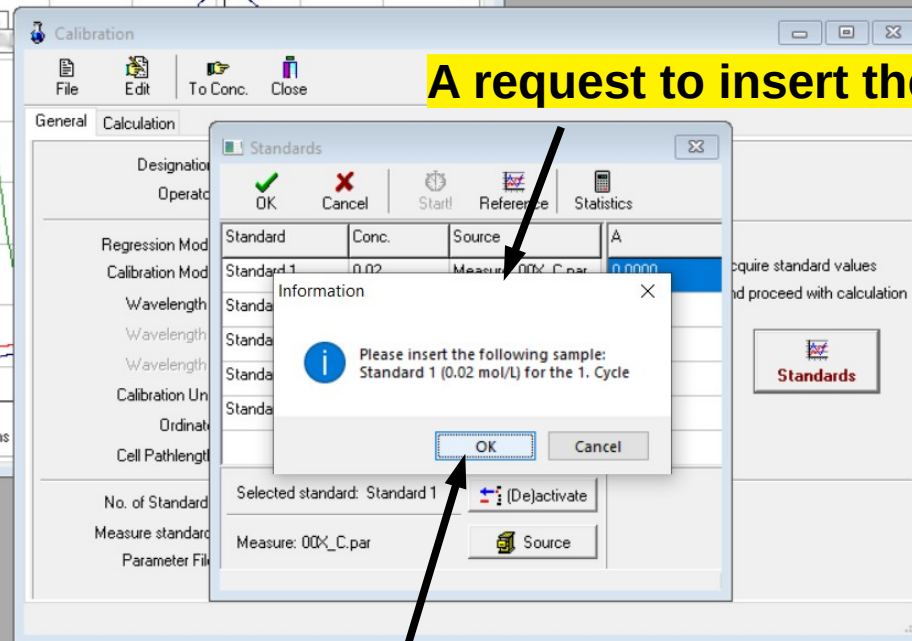
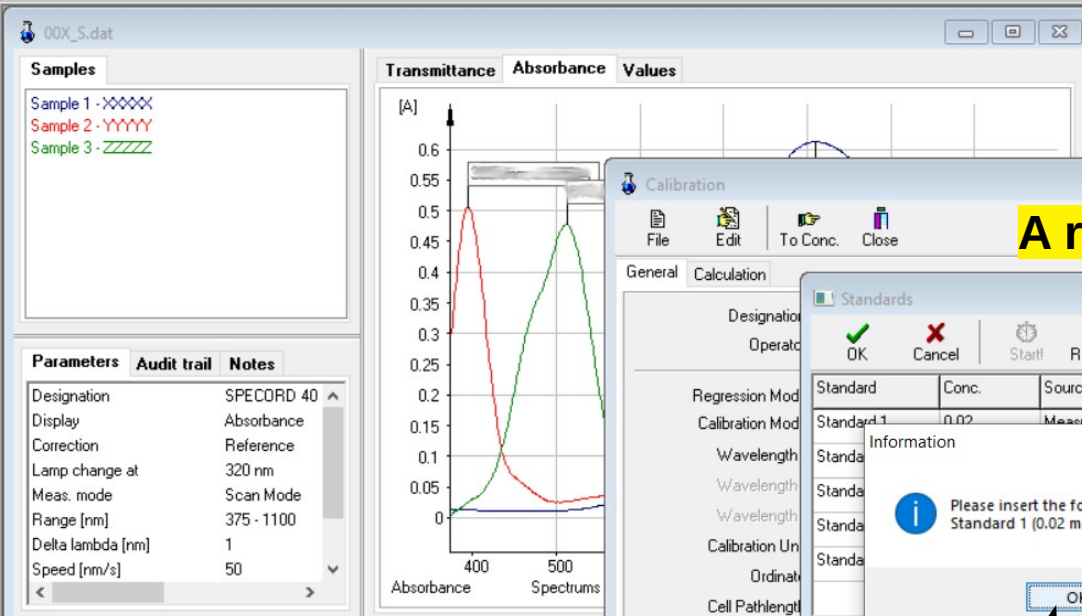
Enter a reference sample and click on the "Reference" icon.



1. Click on the "Start!" Icon.

2. Select "All" from the icon menu.





**A request to insert the A1 standard appears.**

**Click on the "OK" button after insert the A1 standard.**



00X\_S.dat

**Samples**

Sample 1 - XXXXX  
Sample 2 - YYYYY  
Sample 3 - ZZZZZ

**Parameters** **Audit trail** **Notes**

Designation: SPECORD 40  
Display: Absorbance  
Correction: Reference  
Lamp change at: 320 nm  
Meas. mode: Scan Mode  
Range [nm]: 375 - 1100  
Delta lambda [nm]: 1  
Speed [nm/s]: 50

**Transmittance** **Absorbance** **Values**

[A]

Absorbance Spectrums

**Calibration**

File Edit To Conc. Close

General Calculation

Designation: OK Cancel Start Reference Statistics

Operator: [ ]

Regression Mod: [ ]

Calibration Mod: [ ]

Wavelength: [ ]

Wavelength: [ ]

Calibration Un: [ ]

Ordinate: [ ]

Cell Pathlength: [ ]

No. of Standard: [ ]

Measure standard: [ ]

Parameter File: [ ]

**Standards**

Standard Conc. Source A

Standard 1 0.02 Measure: 00X\_C.par

**Information**

Please insert the following sample:  
Standard 2 (0.04 mol/L) for the 1. Cycle

OK Cancel

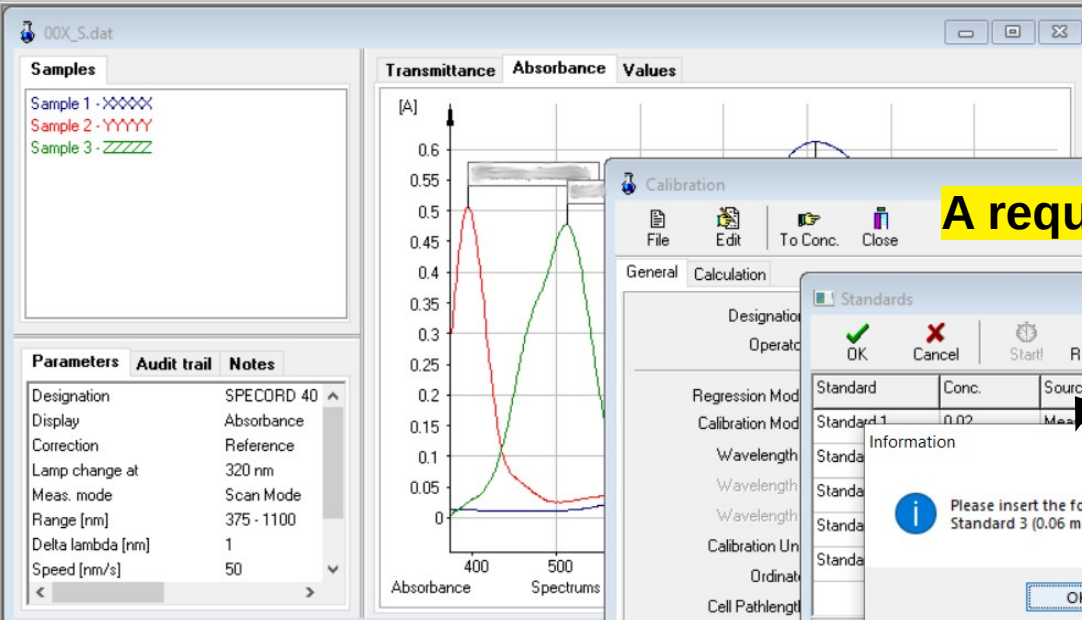
Selected standard: Standard 1 (De)activate

Measure: 00X\_C.par Source

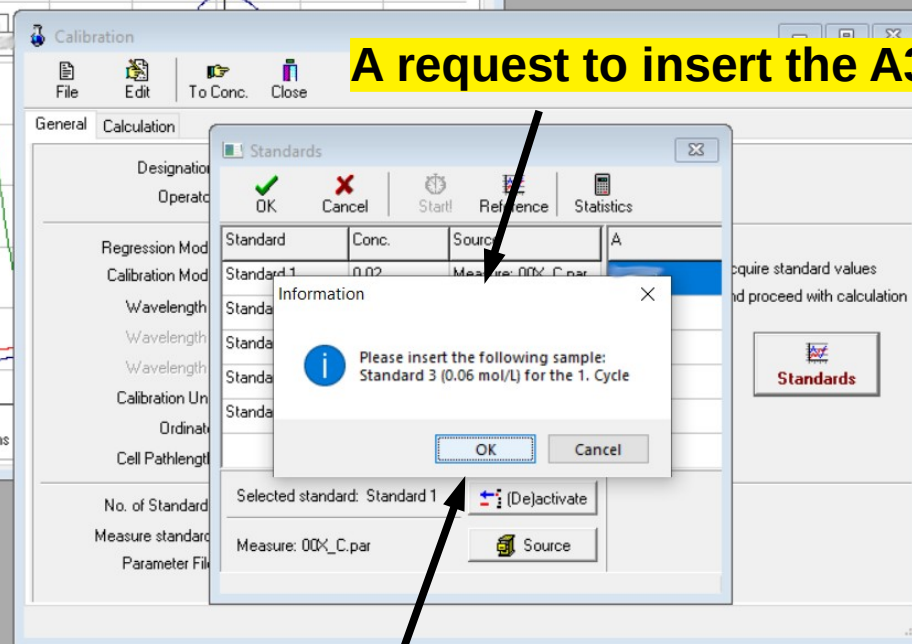
**A request to insert the A2 standard appears.**

**Click on the "OK" button after insert the A2 standard.**





**A request to insert the A3 standard appears.**



**Click on the "OK" button after insert the A3 standard.**



00X\_S.dat

**Samples**

Sample 1 - XXXXX  
Sample 2 - YYYYY  
Sample 3 - ZZZZZ

**Parameters** **Audit trail** **Notes**

Designation: SPECORD 40  
Display: Absorbance  
Correction: Reference  
Lamp change at: 320 nm  
Meas. mode: Scan Mode  
Range [nm]: 375 - 1100  
Delta lambda [nm]: 1  
Speed [nm/s]: 50

**Transmittance** **Absorbance** **Values**

[A]

Absorbance Spectrums

**Calibration**

File Edit To Conc. Close

General Calculation

Designation: Operator: OK Cancel Start Reference Statistics

Regression Mod: Standard Conc. Source A

Calibration Mod: Standard 1 0.02 Measure: 00X\_C.par

Wavelength: Standard

Wavelength: Standard

Calibration Un: Standard

Ordinate: Standard

Cell Pathlength: Standard

No. of Standard: Standard 1 (De)activate

Measure standard: Measure: 00X\_C.par Source

Parameter File: Standard

**Information**

Please insert the following sample:  
Standard 4 (0.08 mol/L) for the 1. Cycle

OK Cancel

**Standards**

Standard 1 0.02 Measure: 00X\_C.par

Standard 2 0.04 Measure: 00X\_C.par

Standard 3 0.06 Measure: 00X\_C.par

Standard 4 0.08 Measure: 00X\_C.par

Standard 5 0.10 Measure: 00X\_C.par

Standard 6 0.12 Measure: 00X\_C.par

Standard 7 0.14 Measure: 00X\_C.par

Standard 8 0.16 Measure: 00X\_C.par

Standard 9 0.18 Measure: 00X\_C.par

Standard 10 0.20 Measure: 00X\_C.par

Standard 11 0.22 Measure: 00X\_C.par

Standard 12 0.24 Measure: 00X\_C.par

Standard 13 0.26 Measure: 00X\_C.par

Standard 14 0.28 Measure: 00X\_C.par

Standard 15 0.30 Measure: 00X\_C.par

Standard 16 0.32 Measure: 00X\_C.par

Standard 17 0.34 Measure: 00X\_C.par

Standard 18 0.36 Measure: 00X\_C.par

Standard 19 0.38 Measure: 00X\_C.par

Standard 20 0.40 Measure: 00X\_C.par

Standard 21 0.42 Measure: 00X\_C.par

Standard 22 0.44 Measure: 00X\_C.par

Standard 23 0.46 Measure: 00X\_C.par

Standard 24 0.48 Measure: 00X\_C.par

Standard 25 0.50 Measure: 00X\_C.par

Standard 26 0.52 Measure: 00X\_C.par

Standard 27 0.54 Measure: 00X\_C.par

Standard 28 0.56 Measure: 00X\_C.par

Standard 29 0.58 Measure: 00X\_C.par

Standard 30 0.60 Measure: 00X\_C.par

Standard 31 0.62 Measure: 00X\_C.par

Standard 32 0.64 Measure: 00X\_C.par

Standard 33 0.66 Measure: 00X\_C.par

Standard 34 0.68 Measure: 00X\_C.par

Standard 35 0.70 Measure: 00X\_C.par

Standard 36 0.72 Measure: 00X\_C.par

Standard 37 0.74 Measure: 00X\_C.par

Standard 38 0.76 Measure: 00X\_C.par

Standard 39 0.78 Measure: 00X\_C.par

Standard 40 0.80 Measure: 00X\_C.par

Standard 41 0.82 Measure: 00X\_C.par

Standard 42 0.84 Measure: 00X\_C.par

Standard 43 0.86 Measure: 00X\_C.par

Standard 44 0.88 Measure: 00X\_C.par

Standard 45 0.90 Measure: 00X\_C.par

Standard 46 0.92 Measure: 00X\_C.par

Standard 47 0.94 Measure: 00X\_C.par

Standard 48 0.96 Measure: 00X\_C.par

Standard 49 0.98 Measure: 00X\_C.par

Standard 50 1.00 Measure: 00X\_C.par

Standard 51 1.02 Measure: 00X\_C.par

Standard 52 1.04 Measure: 00X\_C.par

Standard 53 1.06 Measure: 00X\_C.par

Standard 54 1.08 Measure: 00X\_C.par

Standard 55 1.10 Measure: 00X\_C.par

Standard 56 1.12 Measure: 00X\_C.par

Standard 57 1.14 Measure: 00X\_C.par

Standard 58 1.16 Measure: 00X\_C.par

Standard 59 1.18 Measure: 00X\_C.par

Standard 60 1.20 Measure: 00X\_C.par

Standard 61 1.22 Measure: 00X\_C.par

Standard 62 1.24 Measure: 00X\_C.par

Standard 63 1.26 Measure: 00X\_C.par

Standard 64 1.28 Measure: 00X\_C.par

Standard 65 1.30 Measure: 00X\_C.par

Standard 66 1.32 Measure: 00X\_C.par

Standard 67 1.34 Measure: 00X\_C.par

Standard 68 1.36 Measure: 00X\_C.par

Standard 69 1.38 Measure: 00X\_C.par

Standard 70 1.40 Measure: 00X\_C.par

Standard 71 1.42 Measure: 00X\_C.par

Standard 72 1.44 Measure: 00X\_C.par

Standard 73 1.46 Measure: 00X\_C.par

Standard 74 1.48 Measure: 00X\_C.par

Standard 75 1.50 Measure: 00X\_C.par

Standard 76 1.52 Measure: 00X\_C.par

Standard 77 1.54 Measure: 00X\_C.par

Standard 78 1.56 Measure: 00X\_C.par

Standard 79 1.58 Measure: 00X\_C.par

Standard 80 1.60 Measure: 00X\_C.par

Standard 81 1.62 Measure: 00X\_C.par

Standard 82 1.64 Measure: 00X\_C.par

Standard 83 1.66 Measure: 00X\_C.par

Standard 84 1.68 Measure: 00X\_C.par

Standard 85 1.70 Measure: 00X\_C.par

Standard 86 1.72 Measure: 00X\_C.par

Standard 87 1.74 Measure: 00X\_C.par

Standard 88 1.76 Measure: 00X\_C.par

Standard 89 1.78 Measure: 00X\_C.par

Standard 90 1.80 Measure: 00X\_C.par

Standard 91 1.82 Measure: 00X\_C.par

Standard 92 1.84 Measure: 00X\_C.par

Standard 93 1.86 Measure: 00X\_C.par

Standard 94 1.88 Measure: 00X\_C.par

Standard 95 1.90 Measure: 00X\_C.par

Standard 96 1.92 Measure: 00X\_C.par

Standard 97 1.94 Measure: 00X\_C.par

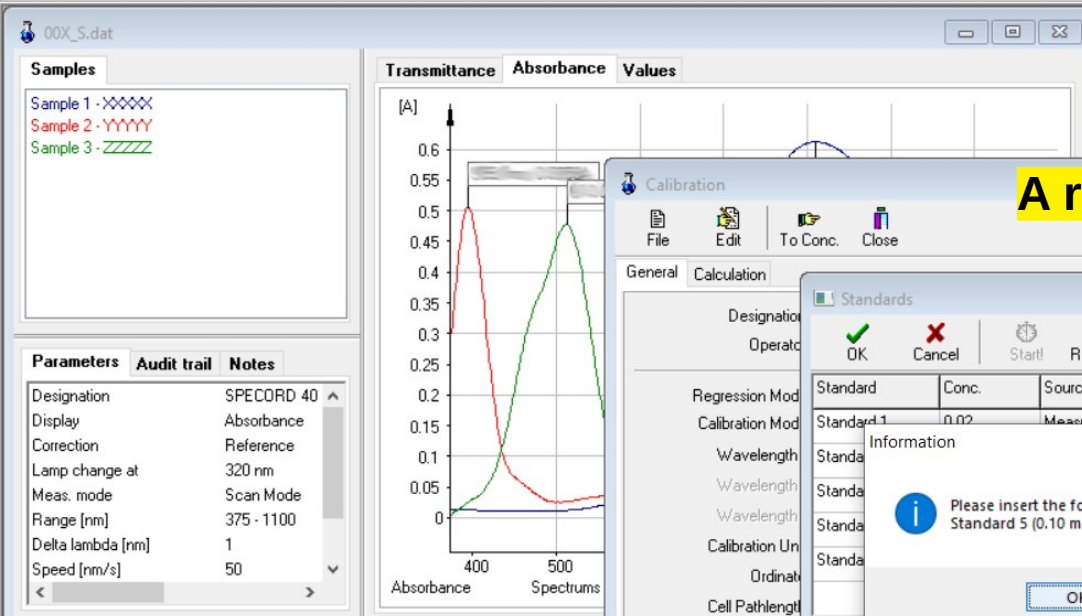
Standard 98 1.96 Measure: 00X\_C.par

Standard 99 1.98 Measure: 00X\_C.par

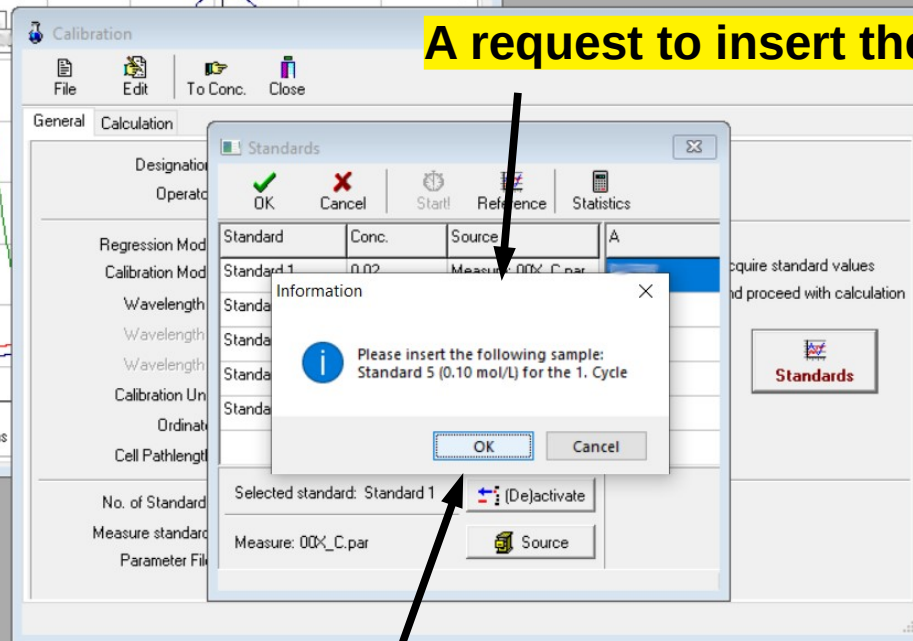
Standard 100 2.00 Measure: 00X\_C.par

**A request to insert the A4 standard appears.**

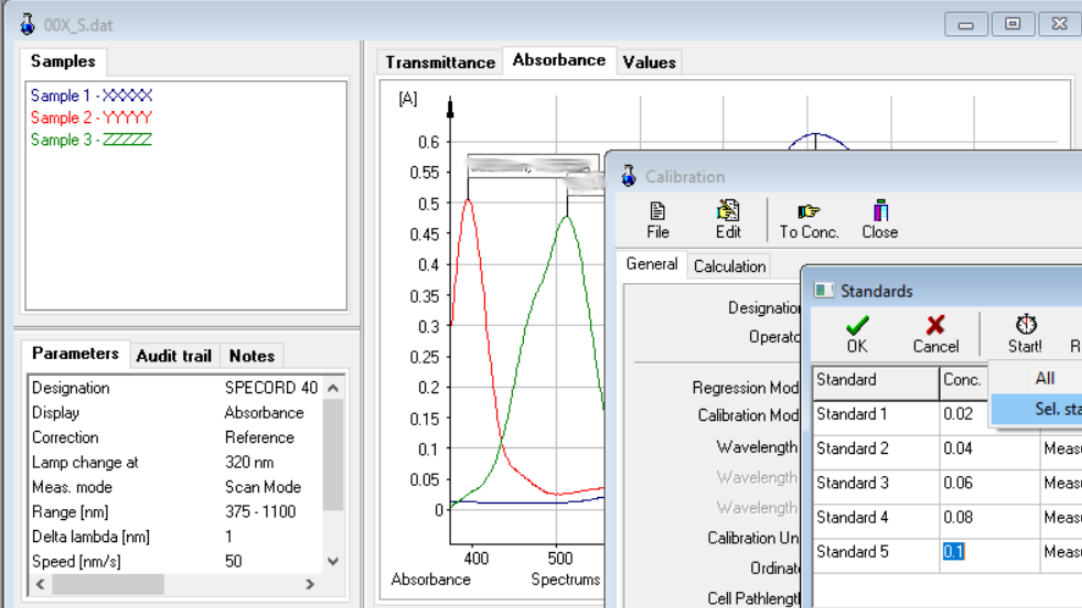
**Click on the "OK" button after insert the A4 standard.**



A request to insert the A5 standard appears.



Click on the "OK" button after insert the A5 standard.



Calibration

File Edit To Conc. Close

General Calculation

Designation Operator

Regression Mod

Calibration Mod

Wavelength

Wavelength

Calibration Un

Ordinate

Cell Pathlength

No. of Standard

Measure standard

Parameter File

Standards

OK Cancel Start! Reference Statistics

Standard	Conc.	All
Standard 1	0.02	Sel. standard
Standard 2	0.04	Measure: 00X_C.par
Standard 3	0.06	Measure: 00X_C.par
Standard 4	0.08	Measure: 00X_C.par
Standard 5	0.1	Measure: 00X_C.par

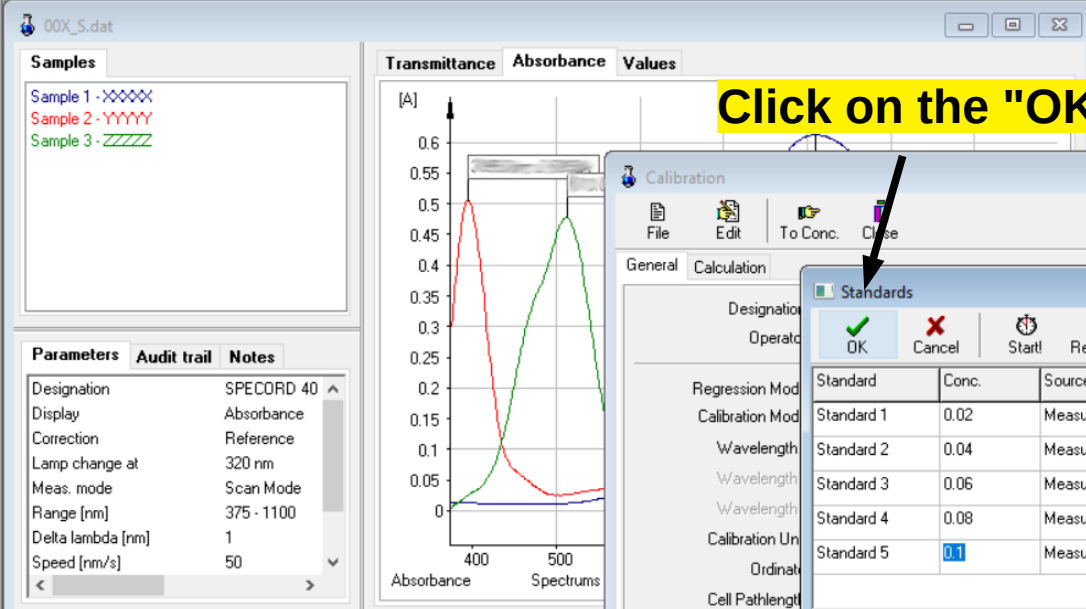
Selected standard: Standard 1 (De)activate

Measure: 00X\_C.par Source

Standards

Require standard values and proceed with calculation

In case an error when measuring any standard. Perform separate measurement its using the "Sel. Standard " in the "Start!" icon menu.



Click on the "OK" icon after measuring all the standards.

Calibration

File Edit To Conc. Close

General Calculation

Designation  
Operator

Regression Mod

Calibration Mod

Wavelength

Wavelength

Calibration Un

Ordinate

Cell Pathlength

No. of Standard

Measure standard

Parameter File

Standards

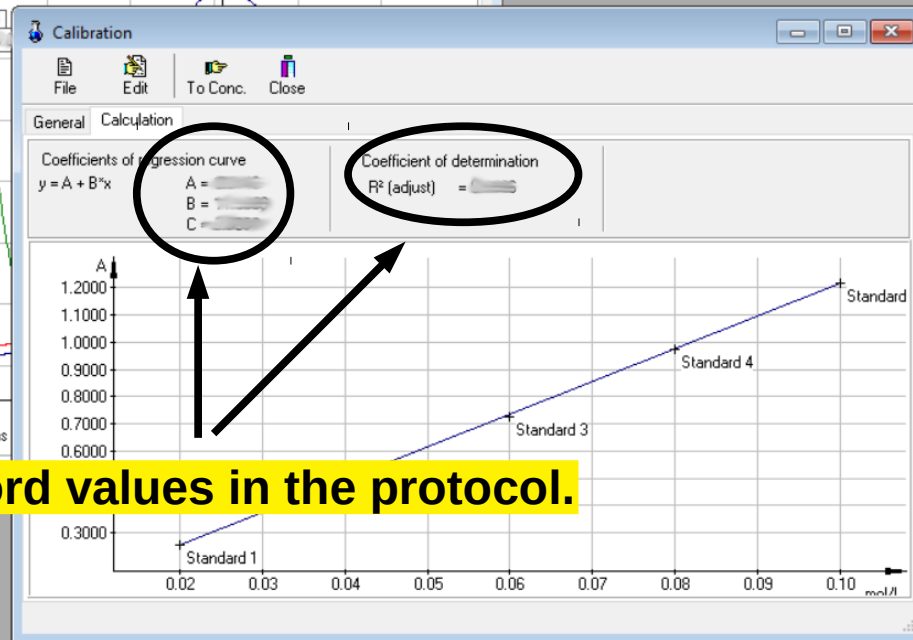
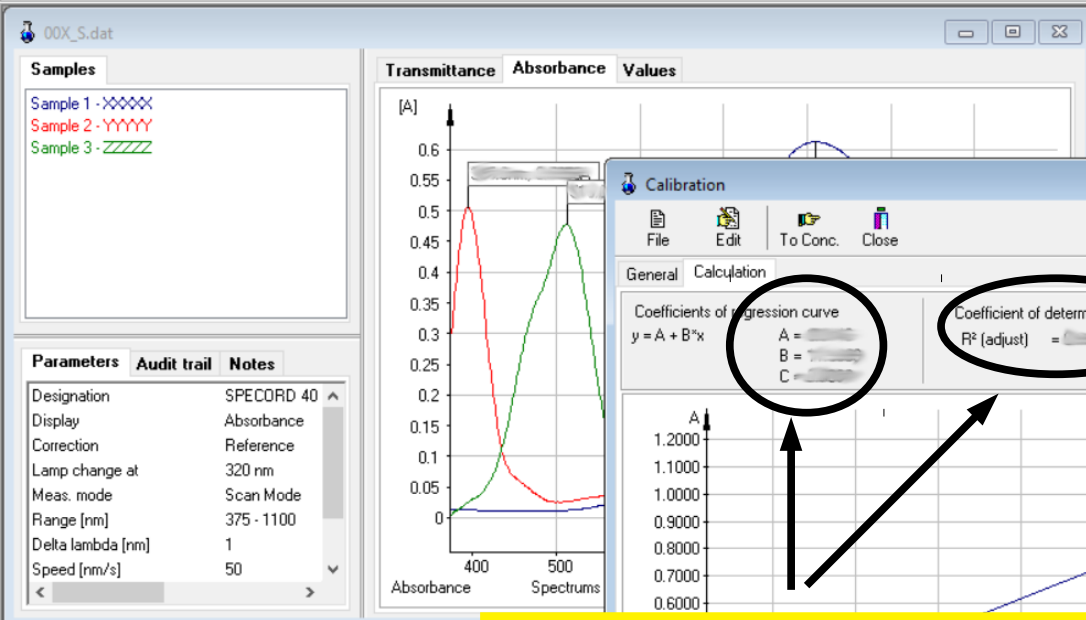
OK Cancel Start! Reference Statistics

Standard	Conc.	Source	A
Standard 1	0.02	Measure: 00X_C.par	
Standard 2	0.04	Measure: 00X_C.par	
Standard 3	0.06	Measure: 00X_C.par	
Standard 4	0.08	Measure: 00X_C.par	
Standard 5	0.1	Measure: 00X_C.par	

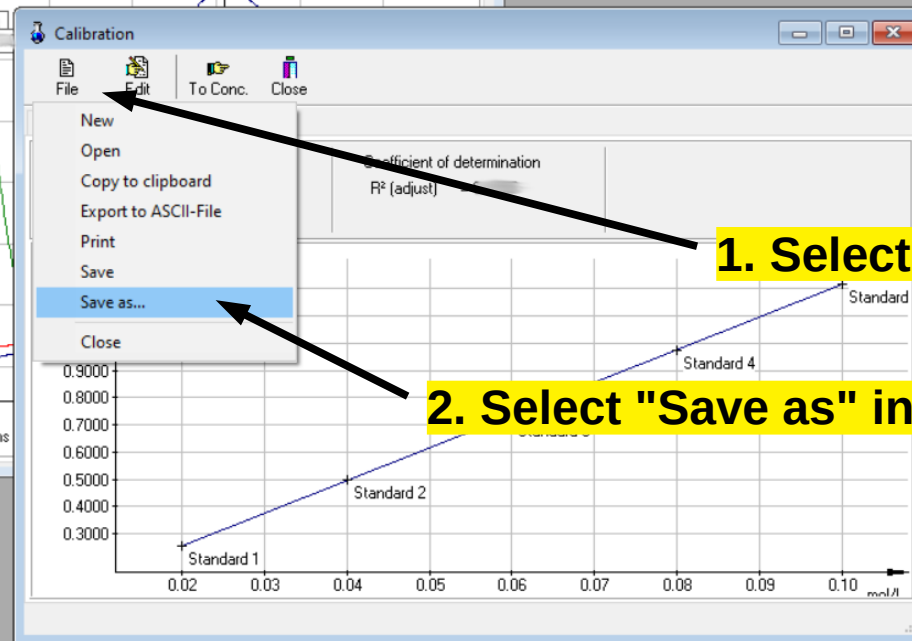
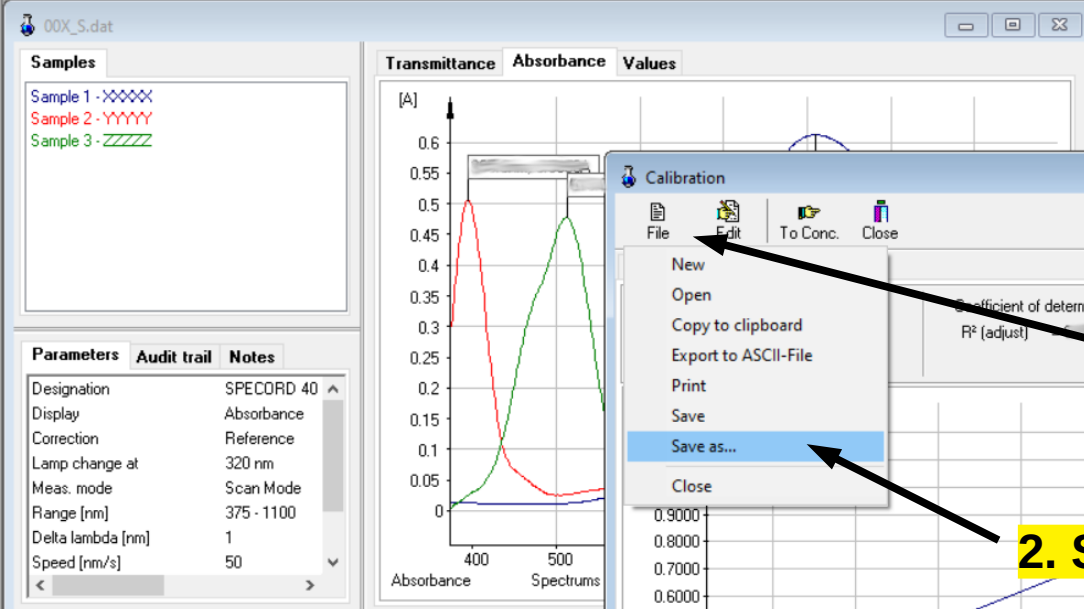
Selected standard: Standard 1 (De)activate

Measure: 00X\_C.par Source

Standards



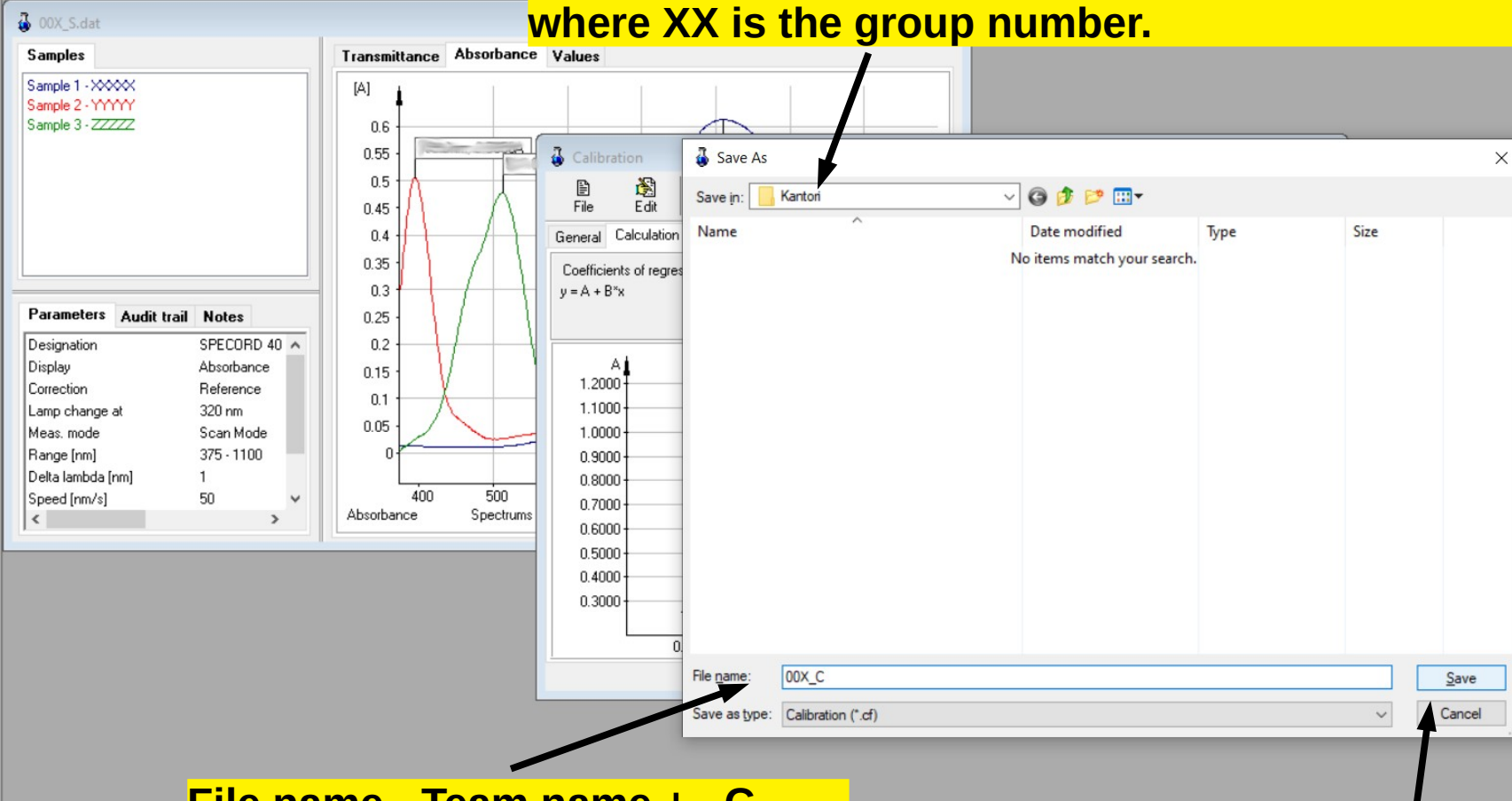
**Record values in the protocol.**



1. Select "File" in the menu.

2. Select "Save as" in the submenu.

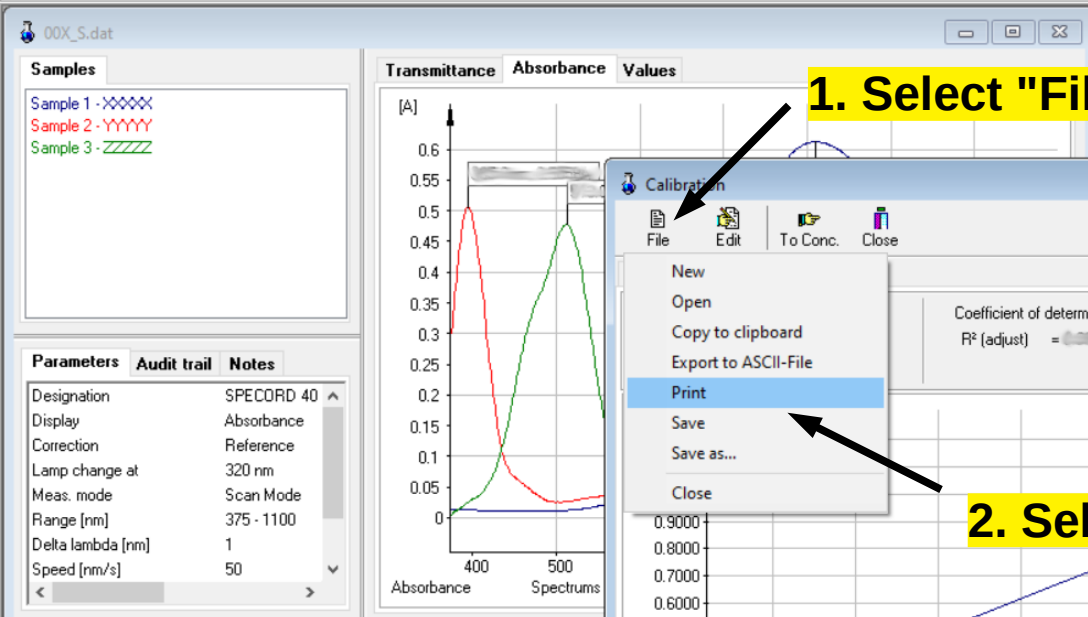
Save the file in the directory Documents\Practicals\_EN\GroupXX, where XX is the group number.



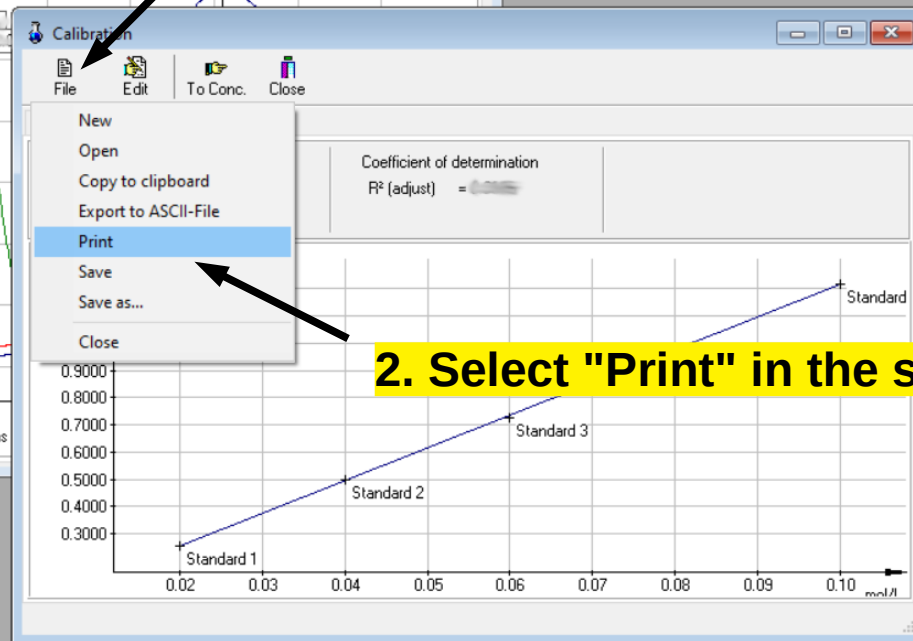
File name - Team name + \_C  
(The file name consists of the team name and the \_C suffix)

Finally, press the "Save" button.





1. Select "File" in the menu.



2. Select "Print" in the submenu.



00X\_S.dat

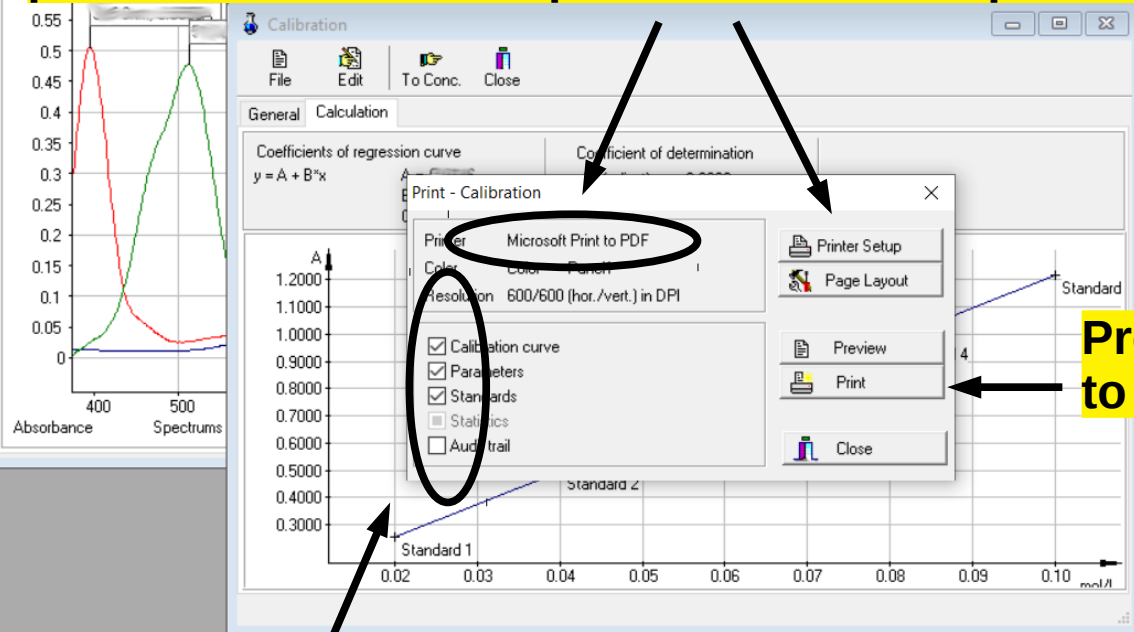
**Samples**

Sample 1 - XXXXX  
Sample 2 - YYYYY  
Sample 3 - ZZZZZ

**Parameters** **Audit trail** **Notes**

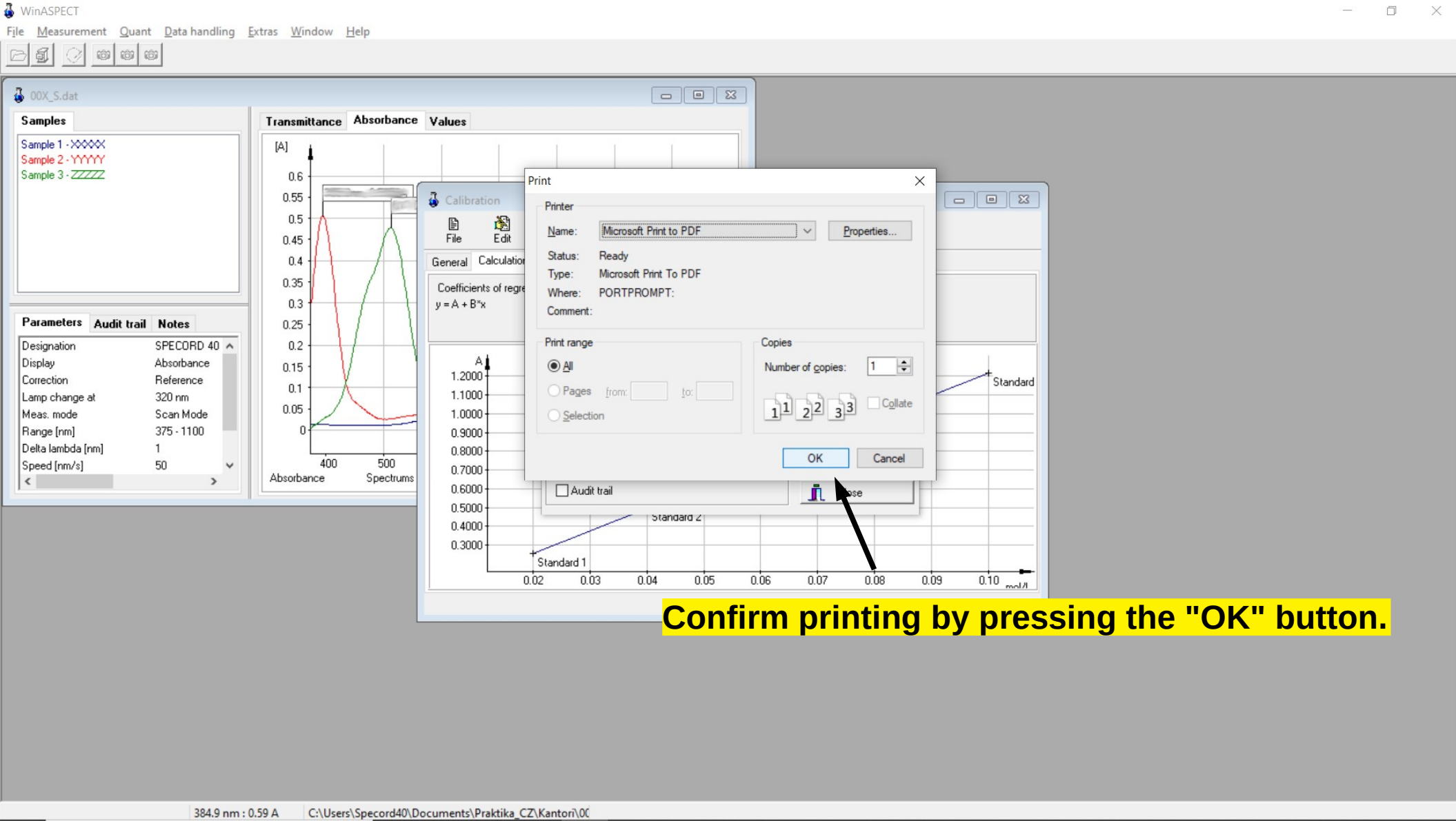
Designation	SPECORD 40
Display	Absorbance
Correction	Reference
Lamp change at	320 nm
Meas. mode	Scan Mode
Range [nm]	375 - 1100
Delta lambda [nm]	1
Speed [nm/s]	50

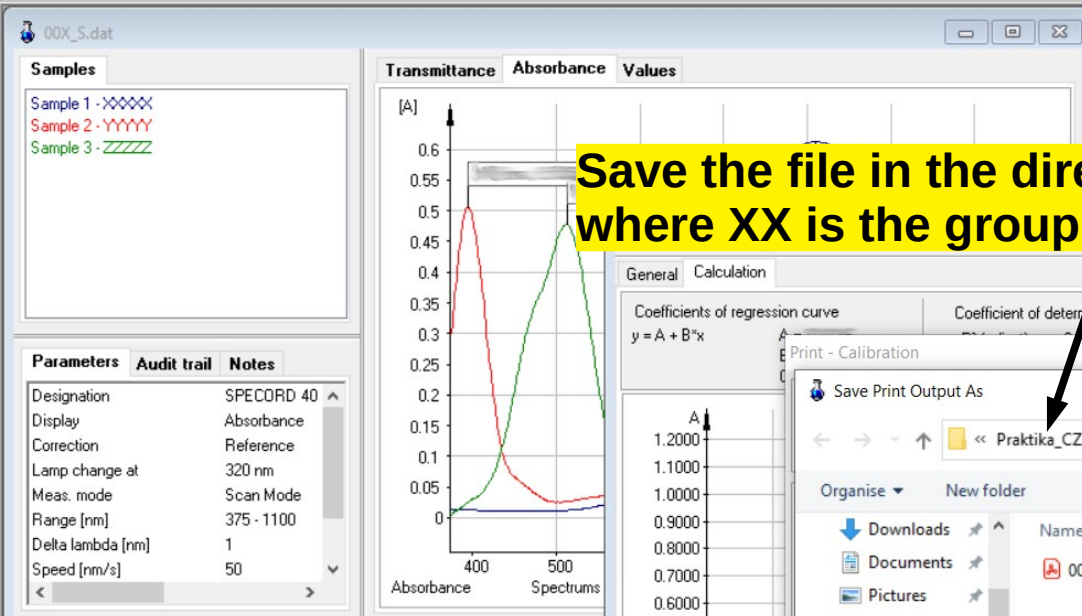
**Make sure "Printer" is set to "Microsoft Print to PDF. Otherwise, press the "Printer Setup" button and set up the correct printer.**



**Press the "Print" button to print.**

**Make sure the first three options are turned on and the "Audit trial" option is turned off.**

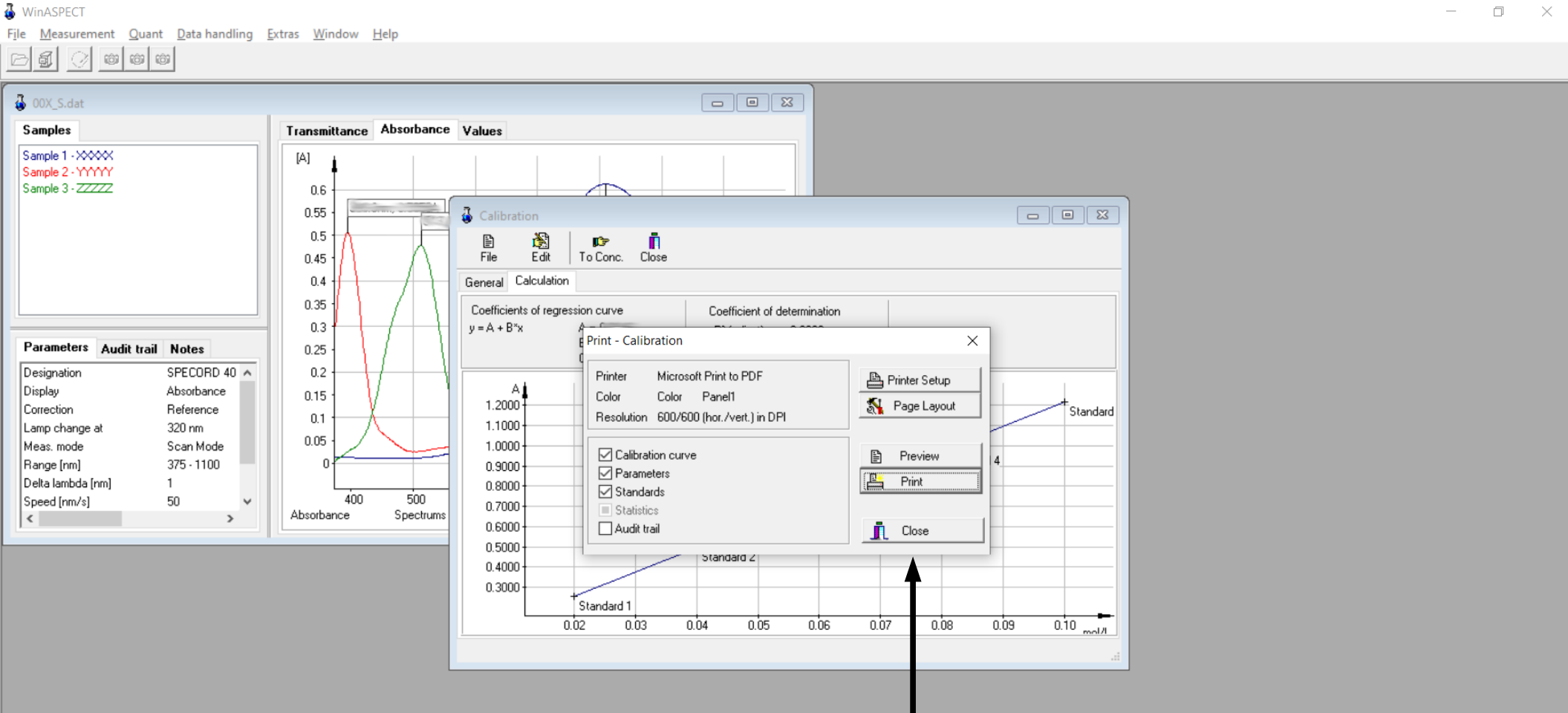




Save the file in the directory Documents\Practicals\_EN\GroupXX, where XX is the group number.

Finally, press the "Save" button.

File name - Team name + \_C  
(The file name consists of the team name and the \_C suffix)



**The "Print - Calibration" window is closed by pressing the "Close" button.**



00X\_S.dat

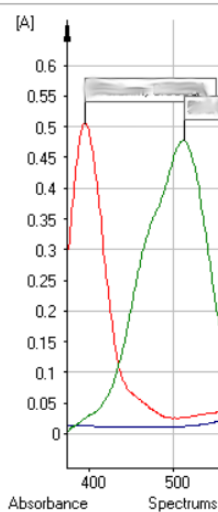
## Samples

Sample 1 - XXXXX  
Sample 2 - YYYYY  
Sample 3 - ZZZZZ

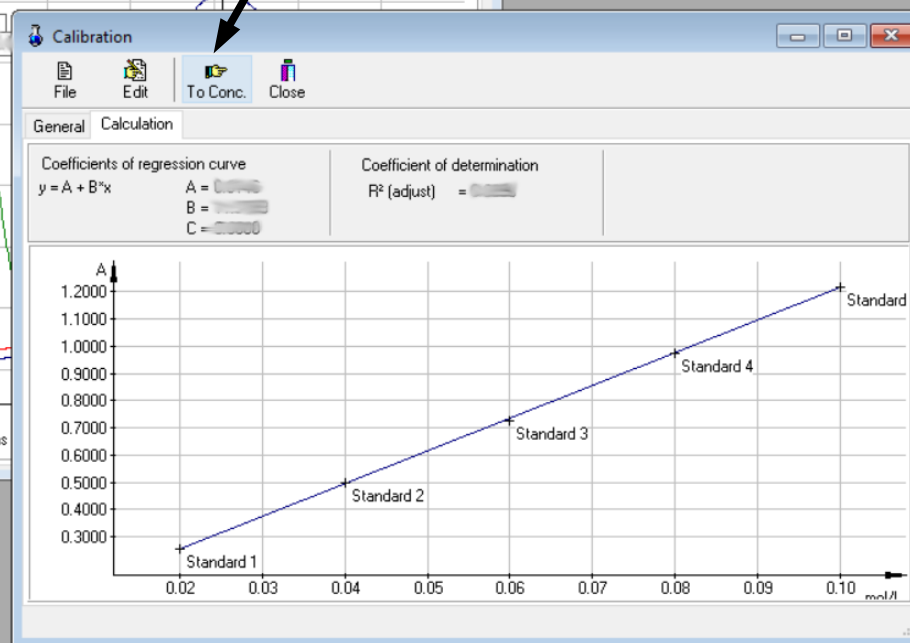
## Parameters Audit trail Notes

Designation SPECORD 40  
Display Absorbance  
Correction Reference  
Lamp change at 320 nm  
Meas. mode Scan Mode  
Range [nm] 375 - 1100  
Delta lambda [nm] 1  
Speed [nm/s] 50

## Transmittance Absorbance Values



Click on the "To Conc." icon when the calibration is finished.





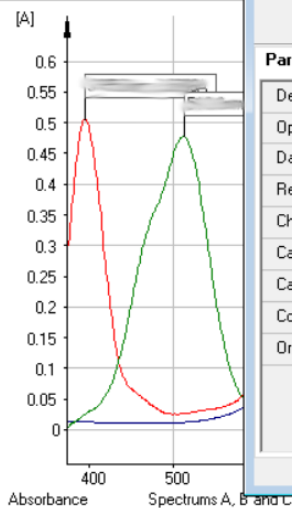
00X\_S.dat

**Samples**

Sample 1 - XXXXX  
Sample 2 - YYYYY  
Sample 3 - ZZZZZ

**Parameters** **Audit trail** **Notes**

Designation SPECORD 40  
Display Absorbance  
Correction Reference  
Lamp change at 320 nm  
Meas. mode Scan Mode  
Range [nm] 375 - 1100  
Delta lambda [nm] 1  
Speed [nm/s] 50

**Transmittance** **Absorbance**

Absorbance Spectra A, B and C

**Concentration**

File Edit Start (File) Start (Meas.) **Reference** Close

**Parameters** **Concentrations** **Calibration Data**

Designation	
Operator	00X
Date/Time	09/10/2021 11:42:20
Repeat measurement	Single
Check	
Calibration data	File
Calibration - File	00X_C.cf
Concentration units	mol/L
Ordinate Unit	A

**Insert a reference sample and click on the "Reference" icon.**

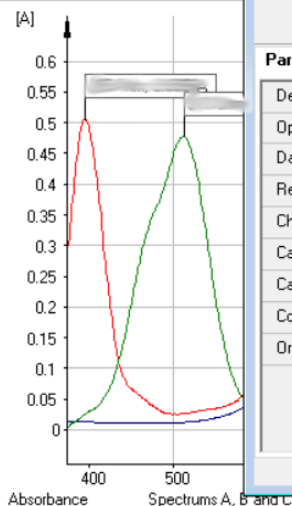


00X\_S.dat

**Samples**

Sample 1 - XXXXX  
Sample 2 - YYYYY  
Sample 3 - ZZZZZ

Parameters	Audit trail	Notes
Designation	SPECORD 40	
Display	Absorbance	
Correction	Reference	
Lamp change at	320 nm	
Meas. mode	Scan Mode	
Range [nm]	375 - 1100	
Delta lambda [nm]	1	
Speed [nm/s]	50	

**Transmittance Absorbance**

**Concentration**

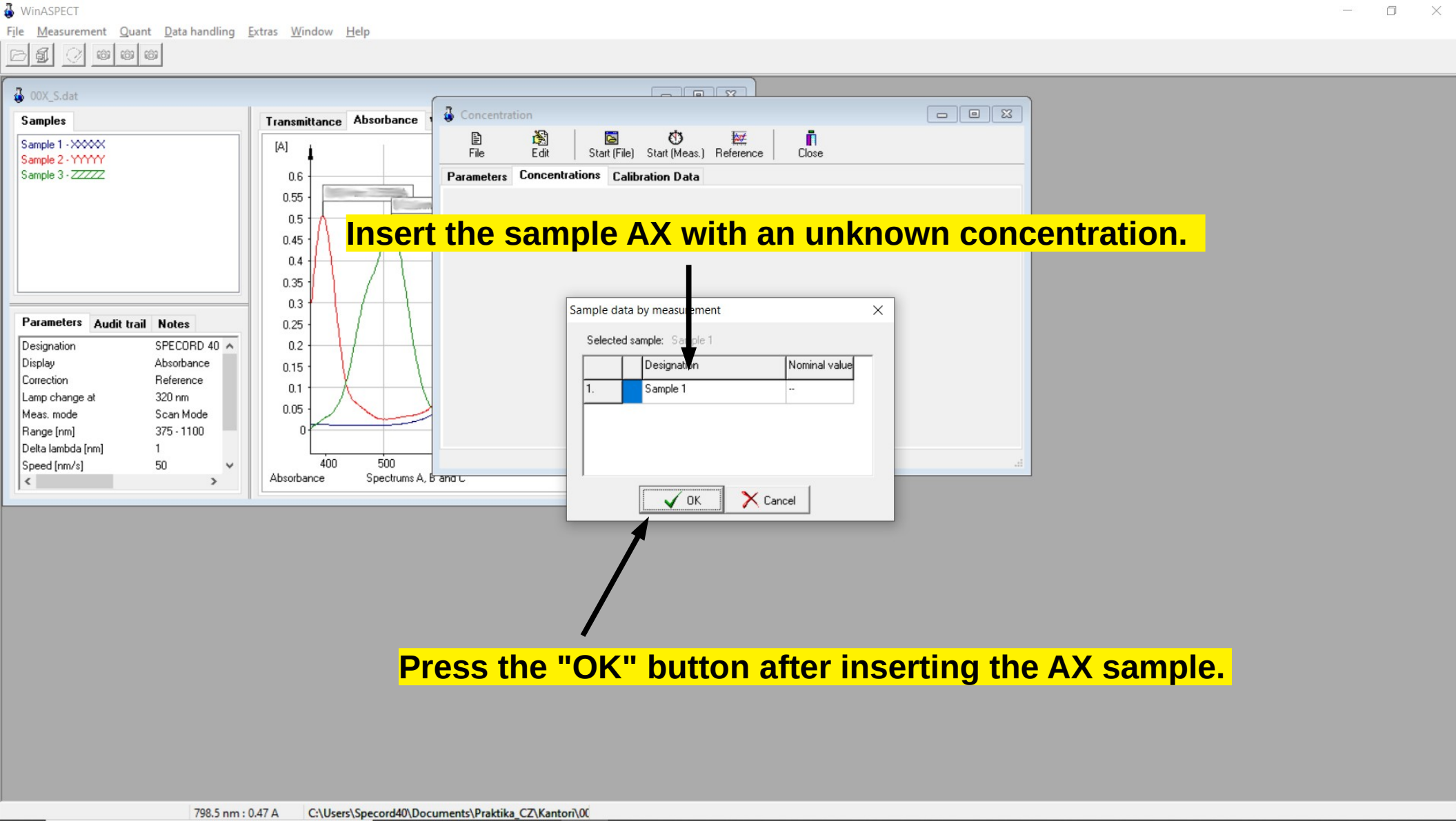
File Edit Start (File) **Start (Meas.)** Reference Close

**Parameters Concentrations Calibration Data**

Designation	
Operator	00X
Date/Time	09/10/2021 11:42:20
Repeat measurement	Single
Check Sample	n
Calibration data	F
Calibration - File	0
Concentration units	n
Ordinate Unit	A

**Click on the "Start (Meas.)" icon after measuring the reference sample.**







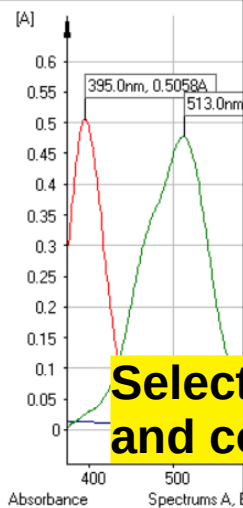
00X\_S.dat

**Samples**

Sample 1 - XXXXX  
Sample 2 - YYYYY  
Sample 3 - ZZZZZ

**Parameters** **Audit trail** **Notes**

Designation SPECORD 40  
Display Absorbance  
Correction Reference  
Lamp change at 320 nm  
Meas. mode Scan Mode  
Range [nm] 375 - 1100  
Delta lambda [nm] 1  
Speed [nm/s] 50

**Transmittance** **Absorbance**

**Concentration**

File Edit Start (File) Start (Meas.) Reference Close

**Parameters** **Concentrations** **Calibration Data**

No.	Sample name	Date/Time	Conc.	Nom. value	Med. value	Span	Stan. dev.
1	Sample 1	09/10/2021 11:44:35	0.000	..	..	..	..

Select the "Concentrations" tab in the "Concentration" subwindow and copy the measured concentration value into the protocol.

WinASPECT

FileMeasurementQuantData handlingExtrasWindowHelp

00X\_S.dat

Samples

Sample 1 - XXXXX  
Sample 2 - YYYYY  
Sample 3 - ZZZZZ

ParametersAudit trailNotes

Designation	SPECORD 40
Display	Absorbance
Correction	Reference
Lamp change at	320 nm
Meas. mode	Scan Mode
Range [nm]	375 - 1100
Delta lambda [nm]	1
Speed [nm/s]	50

TransmittanceAbsorbance

AbsorbanceSpectra A, B and C

Concentration

FileEditStart (File)Start (Meas.)ReferenceClose

ParametersConcentrationsCalibration Data

a =  
b =  
c =

Sample 1

Select the "Calibration Data" tab in the "Concentration" subwindow and copy the measured absorption value into the protocol.

562.8 nm : 0.33 A

C:\Users\Specord40\Documents\Praktika\_CZ\Kanton\00



1. Select "File" in the menu.

00X\_S.dat

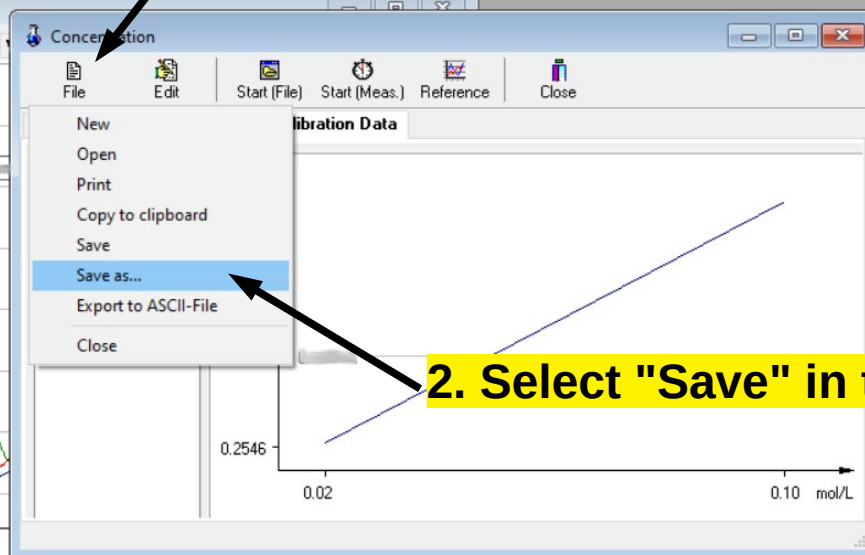
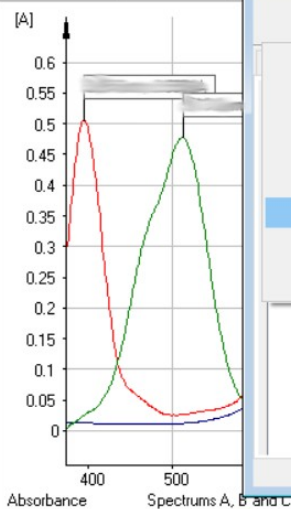
## Samples

Sample 1 - XXXXX  
Sample 2 - YYYYY  
Sample 3 - ZZZZZ

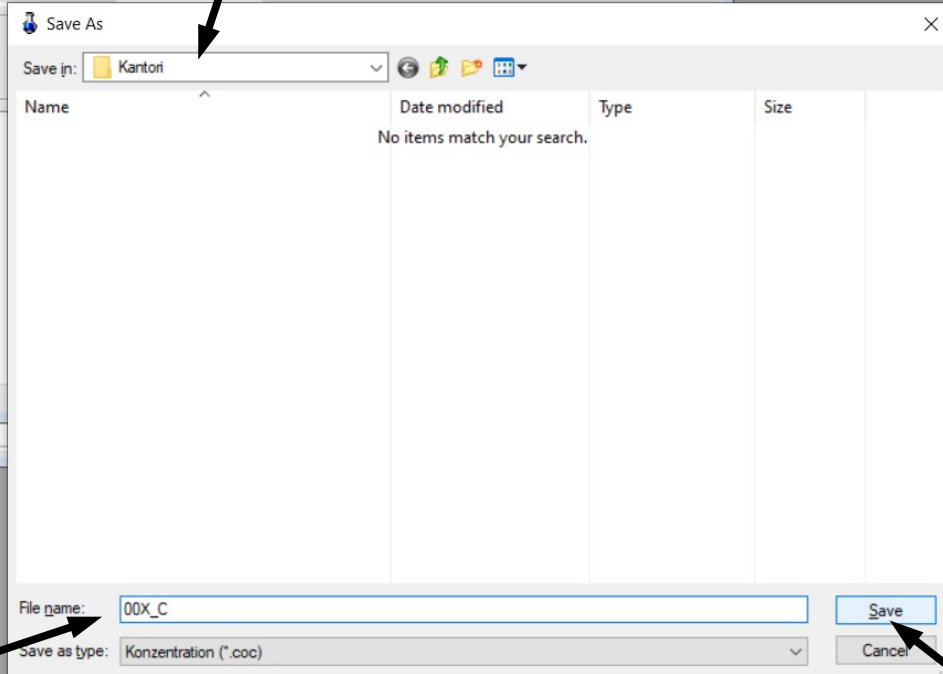
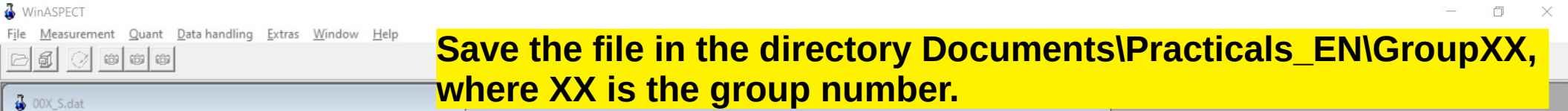
## Parameters Audit trail Notes

Designation	SPECORD 40
Display	Absorbance
Correction	Reference
Lamp change at	320 nm
Meas. mode	Scan Mode
Range [nm]	375 - 1100
Delta lambda [nm]	1
Speed [nm/s]	50

## Transmittance Absorbance



2. Select "Save" in the submenu.



File name - Team name + \_C (File name consists of team name and \_C suffix)

Finally, press the "Save" button.

**The end**